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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/519,934	12/29/2004	Motohisa Ido	OHTN:020	5083
27890	7590	05/25/2007		
STEPTOE & JOHNSON LLP 1330 CONNECTICUT AVENUE, N.W. WASHINGTON, DC 20036			EXAMINER CROUSE, BRETT ALAN	
			ART UNIT 1774	PAPER NUMBER
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/519,934	<b>Applicant(s)</b> IDO ET AL.	
	<b>Examiner</b> Brett A. Crouse	<b>Art Unit</b> 1774	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 29 December 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>20070410; 20041229</u>  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 6 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 6 recites the limitation "as a main component". It is unclear as to what constitutes a main component.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Hosokawa et al., EP 1,167,488 hereinafter known as (Hosokawa).

Hosokawa teaches:

Paragraphs [0008]-[0009], teach an organic light-emitting medium for an electroluminescent device comprising a styryl derivative and an anthracene derivative.

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Paragraph [0016], formula (III), teaches styryl amine derivatives. Attention is directed to pages 28 and 29 of the specification, formulas (A) and (B), opposite formula (III) of Hosokawa.

Paragraph [0025], formulas (I) and (II), teach anthracene derivatives.

Paragraphs [0027]-[0033], formulas (I-a) and (II-a), teach preferred structures of the anthracene derivatives. The substituent groups R1 and R2 can form fused ring structures with the phenyl ring to which they are bonded. Paragraph [0033], additionally teaches that anthracene derivative can be used singly or in combinations.

Paragraphs [0034]-[0036], provide examples of anthracene derivative compounds of formula (I). Attention is directed to compounds EM6, EM27, and EM 28. Compounds EM6, EM27, and EM 28 relative to general formula (2) of the instant invention possess a linking group L1 (-N-) which forms a cyclic structure. Ar' of the instant invention can be an equivalent group as taught in the specification, page 11, lines 3-4, which allow Ar' to be a group represented by Ar.

Paragraph [0037], provides examples of styryl amine derivatives. Compounds EM32-EM61 meet the limitations of an arylamine and a styrylamine as required by claims 7 and 8 as their respective structures contain a nitrogen bonded to three aromatic (aryl) groups as required in the styryl- and aryl- amine definitions (A) and (B), see pages 28 and 29 of the specification. Attention is directed to compounds EM32, EM36, EM39, and EM51 as compounds used in examples as referenced below.

Paragraphs [0073]-[0083], examples 1-18, tables 1-1 and 1-2, teach as examples 5, 10, 11, and 12 electroluminescent devices having one of compound EM27, and EM 28 as the

anthracene derivative and one of EM32, EM36, EM39, and EM51 as the amine derivative in the light emitting layer. In each case the anthracene derivative (component B) is present in a greater amount by weight than the amine derivative (component A), see table 1-1, this is held to meet the limitation that the anthracene derivative is present as the main component as required by claim 6 of the instant invention.

Claims 1, 2 and 4-6 are rejected under 35 U.S.C. 102(b) as being anticipated by Shi et al., US 5,935,721 hereinafter known as (Shi).

Shi teaches:

Column 6, line 53 through column 8, line 19, formula 1, teach an anthracene compound useful in the light emitting layer of an electroluminescent device. Groups 3 and 4 provide fused ring structures bonded to the central anthracene molecule, which meet the structural limitations of claim 1.

Column 17/18 through column 19/20, compounds 28 and 29, provide example compounds of formula 1 meeting the structural limitations of claim 1 useful as light emitting compounds.

Column 47, line 59 through column 48, line 22, teaches a preferred embodiment of the luminescent layer comprising multi-components. The passage additionally teaches that anthracene derivatives can act as a host material for a dopant. The dopant includes arylamines.

Column 33, line 1 through column 38, line 46, examples 3-11, teach electroluminescent devices having an anthracene derivative as light emitting material. Examples 7-11,

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additionally teach that the anthracene light emitting material additionally comprises a dopant.

Claims 1-2 are rejected under 35 U.S.C. 102(b) as being anticipated by Kobori et al., US 6,285,039 hereinafter known as (Kobori).

Kobori teaches:

Column 21, lines 15-39, teach compounds for the light emitting layer of an electroluminescent device. The passage additionally teaches that a host/guest relationship of light emitting compounds is preferred.

Column 22, lines 53-63, formula (V), teach phenylanthracene derivatives as host materials for the light emitting layer.

Column 48, lines 28-59, formula (VII-A), teach preferred host anthracene compounds.

Column 48, line 60 through column 549/550, line 32, provide example compounds.

Attention is directed to compounds:

E-3-412, column 469/470;

which meet the limitations of the anthracene derivatives of the instant invention when Ar and Ar' are matching groups;

and,

E-3-512, column 473/474;

E-3-612, column 477/478;

E-3-712, column 481/482;

E-3-812, column 485/486;

which meet the limitations of the anthracene derivatives of the instant invention when Ar' is a substituted phenyl (aryl) group.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-7, 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishida et al., EP 1,221,434 hereinafter known as (Ishida).

Ishida teaches:

Paragraphs [0006] - [0008], formulas (1) - (6), teach hydrocarbon compounds having an anthracene ring to which a fluorene is directly bound which are useful in an electroluminescent device.

Paragraphs [0009]-[0010], figures 1-8, teach various electroluminescent device structures.

Paragraphs [0014]-[0024], teach various substituents for compounds of formula (1).

Paragraphs [0022]-[0024] further teach that substituent to the anthracene ring include naphthyl groups. The passage further teaches that groups listed as specific examples for X1 and X2 are suitable. It is noted that in the case of alkyl substituents, for example, suitable groups include methyl, n-pentyl, n-octyl, n-decyl, and n-octadecyl.

Paragraph [0068], teaches that compounds of formula (1) can be used as a hole injection transport component, luminescent component, or electron transport compound of an electroluminescent device. Preferably, the compounds of formula (1) are used as hole injection transport components or luminescent components. Most preferably, the compounds of formula (1) are used as luminescent components.

Paragraph [0082], teaches the hole injection transport layer can be formed from a compound of formula (1) in combination with triarylamine derivatives.

Paragraph [0087], teaches that compounds of formula (1) in combination with triarylamine derivatives can be used as the luminescent layer.

Paragraph [0089], teaches that compounds of formula (1) can be use singly or in combination with other luminescent compounds in the luminescent layer.

Paragraph [0090], teaches that when compounds of formula (1) are used in combination with other luminescent compounds a compound of formula can be present in the range of 0.001 to 99.999 weight percent of the combination.

Paragraph [0092], teaches that compounds of formula (1) can be used as host materials in the luminescent layer of an electroluminescent device.

Paragraph [0093], teaches that compounds of formula (1) can be used as host materials with triarylamine derivatives as the guest material in the luminescent layer of an electroluminescent device.

Ishida does not teach:

The specification of Ishida recites substituent groups meeting the claim limitations of the instant invention, however, Ishida does not provide example compounds having groups meeting the claim limitations. It would have been obvious in the absence of unexpected results to expect anthracene derivative compounds having groups such as naphthyl, n-pentyl, n-octyl, n-decyl, and n-octadecyl as substituents of the anthracene ring to provide compounds suitable for use in an electroluminescent device of Ishida as taught by Ishida in paragraphs [0014]-[0024]. With respect to the structure of compound (1) attention is directed to compounds A-7, A-26, A-27, A-28, A-30, A-31, A-33, A-34, A-35, A-36, B-7, B-10, B-26, B-27, B-28, B-30, B-31, B-32, B-34, B-35, B-44, C-26, C-27, C-29, C-30, C-35, C-36, C-37, C-38, C-41, C-42, C-45, D-5, D-21, D-22, D-23, D-24, D-25, D-26, D-27, D-28, D-29, D-30, E-2, F-2, F-5, F-10, F-40, G-17, H-11, H-21, I-5, I-10, I-21, I-22, I-23, I-25, I-26, I-27, I-28, I-29, I-30, I-44, J-2, K-2, L-5, L-21, L-22, L-

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24, L-25, L-26, L-29, L-30, M-11, M-15, M-16, M-18, M-21, N-11, N-15, N-22, O-2, O-19, P-21, P-24, P-26, P-27, P-30, Q-5, Q-10, Q-21, Q-22, Q-24, Q-26, Q-27, Q-28, Q-29, and Q-30 of paragraph [0048] which provide structures meeting the claim limitation that when Ar is a substituted fluorene that (ii) of claim 1 in which the anthracene is substituted is satisfied. Ishida as noted in paragraphs paragraphs [0014]-[0024] teaches equivalents to the substituents which meet the claim limitations with respect to number of carbons of the substituent groups.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shi et al., US 5,935,721 hereinafter known as (Shi) as applied to claims 1, 2 and 4-6 above.

The teachings of Shi in the above rejection are relied upon.

Shi does not teach:

Shi does not provide an example of an electroluminescent device having an anthracene compound meeting the compound limitations of the instant invention as a component of the light emitting layer of an electroluminescent device which additionally comprises an arylamine.

It would have been obvious to one of ordinary skill in the art to use compounds of Shi, such as compounds 29 and 30, meeting the limitations of the instant invention as light emitting materials in an electroluminescent device as taught by Shi. It would further have been obvious to one of ordinary skill in the art to produce the preferred device of Shi by including a dopant, such as an arylamine dopant, in the light emitting layer having an anthracene derivative as host as taught by Shi.

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Claims 4-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobori et al., US 6,285,039 hereinafter known as (Kobori) as applied to claims 1-2 above.

The teachings of Kobori as in the rejection above are relied upon.

Kobori teaches:

Column 23, line 64 through column 24, line 46, teaches that the light emitting layer is preferably a mixed layer comprising in addition to the host/guest relationship of the light emitting materials a hole injecting and transporting compound and an electron injecting and transporting compound.

Column 25, lines 1-5, formula (IV), teach that a styryl amine can be used in the mixed layer as a dopant.

Column 26, line 45 through column 28, line 7, formula (IV), teach amines of formula (IV).

Column 28, line 5 through column 29/30, provide examples of styryl amines of formula (IV).

Column 32, lines 34-63, teach that the light emitting layer can additionally include a tertiary amine and that the amine can be an aromatic tertiary amine.

Column 549, line 52, through column 564, line 48, examples 1-21, teach electroluminescent devices. Examples 14 and 16 employ styryl amines as dopants in the light emitting layer.

Kobori does not teach:

Kobori does not provide an example in which an exemplified compound which meets the chemical structure limitations of the instant invention is used as a light emitting material in an

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electroluminescent device. However, Kobori does provide example compounds meeting the chemical structure limitations of the instant invention as examples of suitable compounds for the light emitting layer.

It would have been obvious to one of ordinary skill in the art to select compounds meeting the limitations of the instant invention as taught by Kobori as host materials in light emitting devices for use in the device of Kobori as host materials of the light emitting layer. Further, with respect to claims 9 and 10 the teachings of Kobori that the light emitting layer can be a mixed layer additionally comprising a hole transport material is held to meet the limitations of claims 9 and 10 when the anthracene derivative acts as the host.

### *Conclusion*

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: US 5,759,709; US 2002/0048688; US 2002/0048687.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brett A. Crouse whose telephone number is 571-272-6494. The examiner can normally be reached on Monday - Friday 6:00AM - 2:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rena Dye can be reached on 571-272-3186. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

BAC

**MARIE YAMNITZKY  
PRIMARY EXAMINER**

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05/24/2007